


Designing quantitative data collection instruments

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
Research process

- Define the problem to be investigated
- Determine the research question / sub questions / hypothesis
- Decide what the objectives for the research will be

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
Literature search/survey

- Read, read, read
- Look for
 - Research designs used
 - Research methods used
 - Examples of data collection instruments
 - Examples of what to look for (i.e .questions – variables to measure)

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Designing the instrument

The information obtained by *each measurement (could be question)* will be specific to the information you will need in your analysis. Therefore, before you compose any questions:

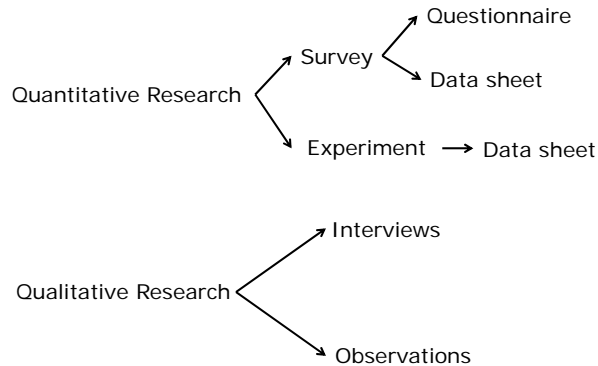
- Think through your research questions and objectives
- Think about how you will conduct your analysis
- Think about the type of results you will need from the analysis

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Types of data collection



Survey questionnaires

Designing the questionnaire

Don't reinvent the wheel!!

Develop (or borrow*) questions/items to measure your specific outcomes

*In general it is perfectly acceptable to borrow questions from other surveys, especially if the results have been published, but always get permission and/or check for copyright restrictions.

Questionnaire introduction

Covering letter/ interview introduction

- Who** you are
- What** you are investigating/researching
- How and where** you can be contacted
 - Details of the university and contact details of supervisor
- Guarantee of confidentiality**
- Length of interview (be honest)

⇒ **Usefulness of study should be clear to all respondents**

Translation



- Preliminary Translation
- Expert Evaluators
- Back Translation
- Crosslanguage Equivalence

Planning the questions



- Write more questions than you need
- Re-draft questions
- Ensure that all the questions cover all key research questions
- Create a table containing questionnaire questions aligned with research questions

Dendrogram technique

Schutte, 2006



- A conceptual framework that guides research questionnaire development
- Start with main research question
 - Then ask the question: "is determined by..."
- Each aspect is broken down further by repeated asking the same question - until all aspects have been dealt with
- On the lowest level questionnaire is developed

[Article](#)

What makes a well designed questionnaire?



- | | |
|---|---|
| ■ Good appearance <ul style="list-style-type: none">→ easy on the eye | ■ Uncomplicated & easy to follow |
| ■ Short and simple | ■ Include simple instructions for answering questions |
| ■ Relevant and logical | ■ Should have clear skip patterns for contingency questions |
| ■ Broken into logical sections | |
| ■ Have a good flow <ul style="list-style-type: none">⇒ Easy data summarisation and analysis | ⇒ High response rate |

What should the order of questions be?

- ❏ Decide on **order** of items/questions
 - ❏ Easy → difficult
 - ❏ General → particular
 - ❏ Factual → abstract
- ❏ Starting questions
 - ❏ Simple
 - ❏ With closed format
 - ❏ Relevant to main subject
 - ❏ Non-offending
 - ❏ Neither demographic nor personal questions
- ❏ Questions are effectively ordered from most salient to least salient
- ❏ **Group questions** by topic/ response options

Content of questions

- ❏ Clear **focus on research question**
- ❏ Avoid sidetracking
- ❏ Avoid asking for unnecessary information
- ❏ **Demographic** information - which?
- ❏ **Contact information** (*if non-anonymous*) – which?

Types of questions

Open-end questions

- | | |
|---|---|
| <ul style="list-style-type: none">❏ Pros<ul style="list-style-type: none">❏ Stimulate free thought❏ Solicit suggestions❏ Clarify positions❏ Richer information | <ul style="list-style-type: none">❏ Cons<ul style="list-style-type: none">❏ Respondent burden❏ Incomplete, irrelevant, un-interpretable responses❏ Coding, analyzing, reporting |
|---|---|

Types of questions

“Forced-choice” (closed-ended) questions

- | | |
|--|---|
| <ul style="list-style-type: none">❏ Pros<ul style="list-style-type: none">❏ Less demanding on respondent❏ Determine levels of intensity, frequency of participation, etc.❏ Use to form scales❏ Easy to analyze and make comparisons | <ul style="list-style-type: none">❏ Cons<ul style="list-style-type: none">❏ Limits richness of data❏ Requires pre-knowledge of responses options |
|--|---|

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Layout

- Instructions should be placed at the point where they are needed
- Use symbols to identify the starting point
- Number questions consecutively
- Use a consistent background

Good Examples








 [Good examples](#)

Not such good examples

-  [First](#)
-  [Second](#)
-  [Third](#)
-  [Fourth](#)

Question Format

Adjust to **responding audience**

-  Professionals vs. public
 -  "...did you expect to walk into a top managerial position ..."
 -  "...continued information sessions re performance management strategy is communicated to my community"
 -  "...development of policing policy specialisation"
-  Keep sentences simple and short
 -  "Out of all the graduates that your company has interviewed for a position, on average how many graduates do not fit into your company? "
 -  Delivery and/or training methods2 (web-based, Problem-based, Outcomes-based, lifelong, etc.) are career-focussed in support of the requirements from industry. Resource allocation to support the delivery method is part of the main vision and mission (strategic focus) of your University of Technology Refer to: characteristic 1

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QUESTION 6

Within the strategic formulation of your University of Technology's vision and mission, to what extent is educational technology included and integrated as a strategic focus? In answering the following statements, indicate as follows:

Column A: the current importance on a scale 1 (High) and 3 (None)

Column B: your future focus and priority on a scale of 1 (High) and 3 (None)

Strategic focus areas as defined within the vision and mission statement OR Educational technology included as part of the vision and mission statement	Column A			Column B			Office use only	
	Current importance			Future importance				
	High	Some	None	High	Some	None		
Delivery and/or training methods ² (web-based, Problem-based, Outcomes-based, lifelong, etc.) are career-focussed in support of the requirement from industry. Resource allocation to support the delivery method is part of the main vision and mission (strategic focus) of your University of Technology <i>Refer to: characteristic 1</i>	1	2	3	1	2	3		6-7

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Good questions

- Use clear and simple language
- Are concise
- Are specific
- Are possible to answer
"Which tourist destination in the Western Cape would be more unsafe for tourist for 2010?" – asked during a survey administered in 2009
- Don't overly tax the respondent's memory
- Are not overly sensitive
- Are accurate

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Good questions

- Are relevant to the respondent
"How efficient or effective would you rate the service of your department versus the community expectations?" asked of members of a police department - what's wrong with it?
- Do not use double negatives
"Do you agree that it is not a good idea to not do regular maintenance checks?"
- Avoid biased terms
"Journalists are lazy"
- Have only 1 part (not "double-barrel")
"Maintenance inspection is carried out every year and damages are fixed as soon as discovered."

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Good questions

- Do not contain assumptions
"Question 1: Does your company have an HIV/AIDS awareness project?"
Question 2: Do all staff members have access to important health services provided by your organization such as STD and HIV/AIDS treatment?"
"How do you know that the organization provide health services? You should first determine that."
- Do not have hidden contingencies
"Have you ever had graduates expect to walk into top positions in your company without the necessary work experience?"
"What % of your students are so weak that you feel they shouldn't even be on the course since they need additional support to succeed? "

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What to avoid



Statements taken directly from text books

"Human Resource Management professionals should contribute to the well-being of the organisation's surrounding community."

Complexity: use simple, conversational language

"How do you feel about the notion that we ought to be actively involved in taking engineering to the community?"

vs.

"How do you feel about taking engineering to the community?"

What to avoid



Leading questions (forcing or pushing for a certain response)

"Wouldn't you agree that transformation in SA has only raised awareness about gender inequality, and women continue to face barriers to their career advancement?"

or

"Do MBA graduates get promoted quicker than other employees without the qualification in your company?"

or

"Do you feel that the toll roads, which will skyrocket SA taxes, are unfair?"

or

"Isn't it fair to think that your current line manager is better than your previous line manager?"

What to avoid



Loaded questions

"Loaded questions are designed (deliberately or by accident) to do more than get straight answers. Typically they seek to change minds by coercive stealth rather than open inquiry."

http://changingminds.org/techniques/questioning/loaded_questions.htm

"Do you think the baboons causing havoc in the Southern Suburbs should be chased away from built-up areas?"

Rather use:

"How do you think the problem of the baboons visiting the built-up areas in the Southern Suburbs should be managed?"

What to avoid



Ambiguity: be as specific as possible

"Are you working or studying?" Yes/No

Burdensome questions

"This applies to the typical, but rather onerous, question which requests detailed information on such things as a person's finances, career, or family history. Often such questions require a retrospective response, ask the respondent to report on behalf of a third party, or require household records to be consulted"
(Warriner, 1991)

What to avoid

- Statements that elicit the same response from everybody

To what extent do you agree that these factors contribute to create a conducive lecture theater:	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Temperature and ventilation of the theater					
Acoustical (sound) control system of the theater					
Lighting of the theater					
Cleanliness of the theater					
Internal finishes (aesthetic features) of the theater					
Health and safety state of the theater					

Everything listed here will be agreed to by every respondent.
This means that doing a statistical analysis on this type of statement is useless



http://www.timesofmalta.com/articles/view/20121014/cartoons/ZTV-Questionnaire_440975

Response Options

Make sure your response options:

- Reflect the concepts you are trying to measure
- Fit with the question wording
- Get at level of precision/intensity needed
- Allow for comparisons between items
- Use "undecided/don't know" sparingly
- Are used consistently
- Use balanced scales
- Are mutually exclusive
- Are exhaustive

The Attitude Measuring Process

- RANKING - Rank order preference
- RATING - Estimates magnitude of a characteristic
- SORTING - Arrange or classify concepts
- CHOICE - Selection of preferred alternative

Response Options



Some common scales:

- Excellent, Good, Fair, Poor
- Strongly agree, Agree, Disagree, Strongly disagree
- Very useful, Somewhat useful, Not very useful, Not at all useful
- Definitely, Probably, Probably not, Definitely Not
- All of the time, Most of the time, Some of the time, Seldom, Never
- Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree

Data Sheet



- Need to determine exactly what is needed to be captured – and at which levels

[Draft example](#)

[Final example](#)

Data from experiments



[Example 1](#)

[Example 2](#)

The statistician needs to know EXACTLY how the experiment was done – treatments levels, replicates, repeated measures, anything extra that was measure. How? When?, etc

Pilot



A pilot or pre-test is important!

Test for:

- Question clarity
- Questionnaire format
- Variance in responses
- Etc.
- Pilot with a similar group of people to your intended subjects
- Highlights problems before starting
- Effects of alternative wording
- Overall impression on respondents and interviewers
- Final polishing after several amendments

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